

THE SPECIFIC IDENTITY OF *BIDENS HYPERBOREA* AND
B. COLPOPHILA.

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IN 1885 Mr. J. M. Macoun collected at Rupert House, James Bay, a little *Bidens* which was subsequently described as *B. hyperborea* Greene.¹ This collection consisted of three small plants each with one head and with the foliage badly mangled. Somewhat later the present writer,² in attempting to identify a characteristic plant of the tidal reaches of the rivers of the Gaspé Peninsula, finally decided that the Gaspé plant was best placed with *B. hyperborea*, the achenes of the two being exactly alike in their technical characters, that is, they were flat linear-cuneiform strongly striate achenes, without the suberous margins and prominent ribs which are so characteristic of *B. cernua*. Still later, in 1909, material collected in southern Maine, along Winnegance Creek, was referred by Fernald & Wiegand³ on account of its achene-characters to *B. hyperborea*. Subsequently, in studying this material and some other specimens from adjacent waters of the lower Kennebec and Androscoggin systems in Maine, characters were found which seemed to set this Maine plant off very definitely from the little Gaspé plant which had formerly been identified with *B. hyperborea*, and the Maine plant was consequently described as *B. colpophila* Fernald & St. John.⁴ During the summer of 1916 Mr. Bayard Long and the writer collected plants of this affinity extensively in Maine, where they abound on the tidal reaches of the Penobscot and Kennebec systems, and other material heretofore unidentified shows the plant of the lower Penobscot and Kennebec to occur also on the brackish marshes of the Merrimac in Essex County, Massachusetts.

The writer's attention has been redirected to this group of plants by Dr. Earl E. Sherff, who has very kindly called attention to the fact that the Gaspé plant, which had been originally identified with *B. hyperborea*, is very unlike the original James Bay material in some

¹ Greene, *Pittonia*, iv. 257 (1901).

² Fernald, *RHODORA*, x. 201-203 (1908).

³ Fernald & Wiegand, *RHODORA*, xii. 120, 144 (1910).

⁴ Fernald & St. John, *RHODORA*, xvii. 21 (1915).

regards, but that the Maine coast *B. colpophila* is certainly conspecific with *B. hyperborea*. With these decisions of Dr. Sherff the writer is entirely in accord but a detailed study of all the material has convinced him that, although the Gaspé plant differs in certain habital traits, it, with all the other variations, from James Bay, the Maine coast and the lower Merrimac, makes up a single species with certain very clearly marked characters. The superficial trait which separates this complex species of the estuaries and saline marshes, *B. hyperborea*, from the *B. cernua*, with which it is most apt to be confused, is the erect heads which commonly remain quite erect in fruiting,¹ *B. cernua* when well developed having the fruiting heads abruptly nodding. In *B. hyperborea* and its varieties the outer involucre consists of strongly ascending or only slightly spreading bracts; the outer involucre of *B. cernua* being reflexed or strongly divergent, not ascending. The disk-corollas of *B. hyperborea* are 4-toothed, of *B. cernua* commonly 5-toothed. In *B. hyperborea* the anthers are included, becoming exserted only by the shriveling of the corolla; in *B. cernua* the anthers are commonly exserted and conspicuous in the fresh flowering material. But the greatest difference between the two species is in the achenes. In *B. cernua* the fully matured achene is curved and with almost wing-like coarsely retrorse-barbed pale margins and keels and its surfaces between the keels and margins ordinarily smooth or only obscurely furrowed; the outer achenes are 3.3–6.3 mm. long and 2–2.8 mm. wide; and the central achenes 4.2–7.8 mm. long and 1.8–2.5 mm. wide. In *B. hyperborea*, on the other hand, the achenes are straight, flat or flattish and not wing-margined nor with prominent keels, only slightly thickened at the summit and with 7–15 prominent ribs on each face; and the outer are 4.2–8.4 mm. long, the inner 6–10 mm. long, 1.4–1.9 mm. broad, i. e. the achene is flat and more slender than in *B. cernua*.

That *B. hyperborea* (including *B. colpophila*) is thoroughly distinct from *B. cernua* there can be no question, but the species is itself highly variable, the varieties apparently being very definitely isolated. The typical plant from James Bay is not exactly matched by any material the writer has seen, although it is very close to some of the Maine

¹ Some dried material collected by the present writer shows arching of the peduncles which gives in the herbarium the impression that the heads are sometimes nodding; but in these cases the arching was due to leaving the specimens over night in the collecting boxes, and their consequent bending toward the light entering the boxes in the early morning. All material in the field, where the present writer is very familiar with the plant, shows quite definitely ascending fruiting heads.

material. In its absolutely simple monocephalous habit it is extreme, the simplest plants from Maine being usually somewhat branched. The leaves of the James Bay plant are badly crumpled but so far as the writer is able to make out by reconstruction they are blunt or obtuse and with very obscure tothing, the largest leaves measuring about 4 cm. long. The outer bracts of the involucre are 1.5–1.7 cm. long, only slightly exceeding the disk; and the achenes of the Macoun material, some of which have been kindly loaned by Dr. Sherff, measure barely 6 mm. in length, with the marginal awns about 3 mm. long. In these measurements the achenes are like the commoner plant of the Penobscot, Kennebec and Merrimac systems, but much smaller than in the plant of Gaspé rivers or in a very extreme plant which occupies the tidal flats of Cathance River in Maine. But the commoner Maine plant, *B. colpophila*, is much larger in its development than the James Bay specimens, all material definitely branching with the exception of obviously depauperate individuals in which, however, incipient branches are evident. The Maine plant, *B. colpophila*, ordinarily has longer leaves which are mostly long-attenuate at tip and more definitely toothed than in typical *B. hyperborea*; and the outer involucre in *B. colpophila* is decidedly longer, the bracts usually exceeding the disk.

A plant which abounds on the tidal flats of Cathance River and which has been distributed as *B. colpophila* stands apart from both typical *B. hyperborea* and true *B. colpophila* by its much longer achenes. This plant, of which several numbers representing minor variations have been collected, has the outer achenes 7.5–8.5 mm. long, the inner 8.7–10 mm. long with the marginal awns 3.5–5 mm. long, and on account of its extreme abundance along Cathance River and the uniformity of the material collected in large quantity at different spots is considered a pronounced geographic variant. The Gaspé plant which was originally taken for *B. hyperborea* departs from that species in certain conspicuous traits, although its very small subentire leaves are essentially identical with those of the James Bay plant. The Gaspé material shows a very strong tendency to produce numerous arcuate branches; its outer involucre consists of very frondose bracts, 2–6 cm. long, and its achenes are as long as in the Cathance River variant, the outer 6–8 mm. long, the inner 7.5–10 mm. long with marginal awns 3–3.5 mm. long.

To summarize, *B. hyperborea*, as now understood, is an estuary

species of very disrupted range and, presumably on account of the extreme isolation of its habitats, it presents several pronounced geographic variants. These may be defined as follows:

Outer achenes 4.2–5 mm. long; the inner 6–7 mm. long, with marginal awns 1.8–3 mm. long.

Plant simple and monocephalous: leaves oblanceolate and blunt, subentire or obscurely toothed; the longer 4 cm. long: bracts of the outer involucre 1.5–1.7 cm. long, only slightly exceeding the disk.

B. hyperborea (typical).

Stem branching; the branches strongly ascending, few to very numerous: leaves linear to oblanceolate, attenuate, commonly with 3–10 pairs of sharp teeth; the primary leaves 0.5–1.2 dm. long: bracts of the outer involucre 1.5–4 cm. long.....var. *colpophila*.

Outer achenes 6–8.5 mm. long; the inner 7.5–10 mm. long, with marginal awns 3–5 mm. long.

Tall, 3–7 dm. high, with strongly ascending branches: leaves thin, with midrib prominent beneath, long-attenuate at tip; the primary ones 0.6–1.4 dm. long, with numerous sharp teeth: bracts of outer involucre 4–9, linear to lanceolate, acute or acuminate, entire, 1.5–3.5 cm. long.....var. *cathancensis*.

Low, usually depressed and matted, 0.5–2.5 dm. high, the branches usually arcuate: leaves fleshy, obtuse, with midrib obscure; the primary ones 1.5–6.5 cm. long, entire or with 1 or 2 pairs of coarse teeth: bracts of outer involucre 2–4, oblanceolate, obtusish, entire or toothed, 2–6 cm. long.....var. *gaspensis*.

B. HYPERBOREA Greene, *Pittonia* iv. 257 (1901).—The typical form of the species is known only from the original collection from Rupert House, James Bay, September 5, 1885, *J. M. Macoun*, no. 12056.

Var. ***colpophila*** (Fernald & St. John), n. comb. *B. colpophila* Fernald & St. John, *RHODORA*, xvii. 21 (1915).—Tidal flats and borders of salt marshes, Maine and Massachusetts. The following specimens may be cited: MAINE: abundant on tidal mud-flats of the Penobscot River, Bangor, September 7, 1916, *Fernald & Long*, nos. 14829, 14830; very abundant on tidal mud-flats at the mouth of Reed Brook, Hampden, September 8, 1916, *Fernald & Long*, nos. 14831, 14832, also in *Pl. Exsicc. Gray*. no. 296; tidal mud-flats at mouth of Souadabscook Stream, Hampden, September 11, 1916, *Fernald & Long*, nos. 14833, 14834; borders of salt marsh, Back River Creek, Woolwich, September 15, 1916, *Fernald & Long*, no. 14826; above tide-limit at edge of marsh and among sedges and rushes of salt marsh, Winnegance Creek, Phippsburg, August 23, 1909, *Fernald*, nos. 2248, 2249; Cow Island, Topsham, August, 1910, *Kate Furbish*; bank of Androscoggin River, Brunswick, August 13, 1911, *C. H. Bissell*; August 22, 1911, *R. A. Ware*, no. 4230. MASSACHUSETTS: brackish muddy shore of the Merrimac, Newburyport, October 2, 1902, *A. A. Eaton & M. L. Fernald*.

Var. ***cathancensis***, n. var., planta erecta 3–7 dm. alta ramibus valde adscendentibus; foliis tenuibus lineari-oblanceolatis attenuato-acuminatis argute serratis, primariis 0.6–1.4 dm. longis, costa subtus promi-

nente; bracteis involucri exterioribus 4–9 linearibus vel lanceolatis acutis 1.5–3.5 cm. longis; achaeniis exterioribus 7.5–8.5 mm. longis, interioribus 8.7–10 mm. longis aristis marginalibus 3.5–5 mm. longis.

Plant erect, 3–7 dm. high, with strongly ascending branches: leaves thin, linear-oblongate, attenuate-acuminate, coarsely serrate; the primary 0.6–1.4 dm. long, with the midrib prominent beneath: bracts of the outer involucre 4–9, linear or lanceolate, acute, 1.5–3.5 cm. long: outer achenes 7.5–8.5 mm. long; the inner 8.7–10 mm. long, with marginal awns 3.5–5 mm. long.—MAINE: tidal mud-flats of Cathance River, Bowdoinham, September 14 and 19, 1916, *Fernald & Long*, nos. 14825, 14927 (TYPE in Gray Herb.), 14828, also in *Pl. Exsicc.* Gray. no. 295.

Var. **gaspensis**, n. var. *B. hyperborea* Fernald, RHODORA, x. 202 (1908) excluding plant of James Bay.—Estuaries of the rivers of the Gaspé Peninsula, Quebec. The following specimens may be cited: submerged at high tide, brackish shores about the mouth of Dartmouth River, August 26 & 27, 1904, *Collins, Fernald & Pease* (TYPE in Gray Herb.); brackish shore, submerged at high tide, mouth of St. John River, Douglastown, August 23, 1904, *Fernald, Collins & Pease*; brackish shore, submerged at high tide, alluvial islands at the mouth of Bonaventure River, August 4, 1904, *Collins, Fernald & Pease*; material has also been seen from the mouth of York River, Gaspé and from the mouth of Matane River, Matane County (coll. *F. F. Forbes*).

GRAY HERBARIUM.

A NEW PEREZIA ADVENTIVE IN MASSACHUSETTS.

J. FRANCIS MACBRIDE.

DURING last summer a strange daisy-like plant appeared in the vegetable garden of Mrs. Frank E. Lowe of North Worcester, Massachusetts. Because of its attractiveness it was allowed to grow and a specimen was sent to the Gray Herbarium for determination. Now study has disclosed the rather surprising fact that it is a species of *Perezia* seemingly undescribed and not closely related to any of the species in the section of the genus to which it belongs, a section which is represented only in South America. This group of species is at once distinguishable from the true *Perezias* of Mexico and Central America by the pauciseriate involucre and at one time was treated as a separate genus under the name *Homoeanthus*. The species are widely distributed, particularly over the sheep-grazing areas of the